

CLAIMS

1. An ink composition comprising a) a liquid vehicle, b) at least one modified pigment comprising a pigment having attached at least one functional group, c) at least one salt having a polyvalent ion, and d) at least one polymer, wherein said functional group is capable of coordinating with said polyvalent ion.

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2. The ink composition of claim 1, wherein the vehicle is an aqueous vehicle.

10 3. The ink composition of claim 1, wherein the vehicle is a non-aqueous vehicle.

4. The ink composition of claim 1, wherein the ink composition is an inkjet ink composition.

15 5. The ink composition of claim 1, wherein the functional group comprises at least one organic group.

6. The ink composition of claim 5, wherein the organic group comprises at least one ionic group, at least one ionizable group, or a mixture of at least one ionic group and at least one ionizable group.

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7. The ink composition of claim 5, wherein the organic group comprises at least one carboxylate group, sulfonate group, or ammonium group.

25 8. The ink composition of claim 1, wherein the functional group comprises at least one ionic group, at least one ionizable group, or a mixture of at least one ionic group and at least one ionizable group.

9. The ink composition of claim 1, wherein the functional group comprises at least one carboxylate group, sulfonate group, or ammonium group.

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10. The ink composition of claim 1, wherein the functional group is a polymeric group.

11. The ink composition of claim 1, wherein the pigment is carbon black, graphite, 5 vitreous carbon, finely-divided carbon, activated carbon, activated charcoal, or mixtures thereof.

12. The ink composition of claim 11, wherein the pigment is carbon black.

10 13. The ink composition of claim 1, wherein the pigment is a white pigment, a black pigment, a blue pigment, a brown pigment, a cyan pigment, a green pigment, a violet pigment, a magenta pigment, a red pigment, a yellow pigment, shades thereof, or combinations thereof.

15 14. The ink composition of claim 1, wherein the polyvalent ion of the salt comprises a polyvalent metal cation.

15. The ink composition of claim 14, wherein the polyvalent metal cation is a divalent metal cation.

20 16. The ink composition of claim 14, wherein the polyvalent metal cation is a calcium, cadmium, copper, iron, magnesium, nickel, zinc, aluminum, or zirconium cation.

25 17. The ink composition of claim 14, wherein the polyvalent metal cation is selected from the list consisting of: Ca^{+2} , Cd^{+2} , Cu^{+2} , Fe^{+2} , Mg^{+2} , Ni^{+2} , Zn^{+2} , Al^{+3} , Fe^{+3} , and Zr^{+4} .

30 18. The ink composition of claim 1, wherein the polyvalent ion of the salt is Zn^{+2} or Zr^{+4} .

19. The ink composition of claim 1, wherein the polyvalent ion of the salt is Zn^{+2} .

20. The ink composition of claim 1, wherein the salt comprises a polyvalent anion.

21. The ink composition of claim 1, wherein the polymer comprises at least one functional group capable of coordinating with the polyvalent ion.

22. The ink composition of claim 21, wherein the functional group comprises at least one ionic group, at least one ionizable group, or a mixture of at least one ionic group and at least one ionizable group.

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23. The ink composition of claim 21, wherein the functional group comprises at least one carboxylate group, sulfonate group, or ammonium group.

24. The ink composition of claim 1, wherein the polymer is selected from the list consisting of: polyacrylic acid, polymethacrylic acid, copolymers of acrylic acid, copolymers of methacrylic acid, copolymers of maleic acid, and salts thereof.

25. The ink composition of claim 1, wherein the polymer is a styrene-acrylate polymer or a styrene-maleic acid polymer.

20 26. The ink composition of claim 1, wherein the functional group is the at least one polymer.

25 27. A method of generating an image comprising the steps of: 1) incorporating into a printing apparatus an ink composition comprising a liquid vehicle, at least one pigment comprising a pigment having attached at least one functional group, at least one salt with a polyvalent ion, and at least one polymer, and 2) generating an image on a substrate.

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28. The method of claim 27, wherein the liquid vehicle is an aqueous vehicle.

29. The method of claim 27, wherein the liquid vehicle is a non-aqueous vehicle.

30. The method of claim 27, wherein the method is an inkjet ink printing method.

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